Manuscript for

Handbook of Operating Instructions

Radio Set AN/ART-19B

NOTICE OF CHANGES IN THIS ISSUE OF

MANUSCRIPT OF OPERATING INSTRUCTIONS

FOR RADIO SET AN/ART-19B

1. Delete AN/ART-19A wherever referred to in this manual.

   Substitute AN/ART-19B

2. Delete "T-112( )/ART-19A" wherever referred to in this manual.

   Substitute T-121/ART-19B

3. Delete PS-225 wherever referred to in this manual.

   Substitute BD-AK-63, BD-AL-63 or BD-AR-63

   (Modified for use with AN/ART-19B)

MANUSCRIPT FOR

HANDBOOK OF OPERATING

INSTRUCTIONS

RADIO SET AN/ART-19A

RESTRICTED

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DESCRIPTION

1. General

(a) Radio Set [illegible] is an airborne low power transmitter, with a self contained power supply and keying unit (See Figure 1-1). The antenna is of the trailing wire type. The unit utilizes a remote switch for placing the equipment in operation. A push button test switch is provided for making tests before and after installation.

(b) Frequency is governed by a crystal operating in the oscillator stage.

(c) Power amplifier stage utilizes two type 1625 tubes operating in push pull. Power output is 50 watts.

(d) A motor driven keyer assembly, housed in the transmitter case, keys the grid return of the power amplifier stage so that it alternately has a coded R. F. and an unmodulated R. F. output. The coding can be selected from a set of twenty coding cams. On these twenty cams, will appear the entire alphabet, six of the cams can be turned over and make another character. Each cam has its' letter stamped on the side that is visible after cam is in place.

(e) The antenna reel is a modified Hand Riding reel is so constructed with limit and holes that when the transmitter is on the reel will not operate unless the tension of the wire at the holein is greater than 3 ounces. When the antenna wire has been unreeled to its proper length the motor will automatically shut off. The "reel in" push button on transmitter has been installed to reel antenna wire in after final test, however this button shall never be pressed while transmitter is in operation. The limit switch will cause motor to stop reeling in at a tension of 12 pounds.

(f) The power supply is self contained and consists of two seven cell, 1½ volt, storage batteries connected in series. The batteries thus supply 28 volts to the tube filaments, keyer motor, starting relay, reel motor and low voltage input to the

dynamotor

2. Equipment Supplied:

Quantity per Equipment	Name of Unit	Army Type Designation	Navy Type Designation	Overall Dimensions	Weight (Pounds)
1	Radio Transmitter	T-112( )/ART-19A	T-112( )-19A	9 11/16 x 7 1/8 x 6 1/4	11
1	Dynamotor Containing	DM-(*)-43	DM-(*)-43	6 3/4 x 3 3/8 Dia.	8
1	Receptacle	AN3102-22-3P (30-160)	AN3102-22-3P		
1 set	Cams, Coding				
1	Antenna Kit containing the following items:				
1	Reel	RL-42-B			
1	Bobbin(with 200 feet Wire W-106-A)	M-235			
1	Commutator Clamp	MC-163			
1	Fairlead Assembly	F-10-A			
1	Weight	WT-7-A			

3. Equipment Required But Not Supplied:

Quantity per Equipment	Name of Unit	Army Type Designation	Navy Type Designation	Required Characteristics
1	Plug	PL-152-A		
1	Plug	AN3106-22-4S	AN3106-22-4S	
1	Plug	PL-259		
1	Plug	PL-156		
1	Plug	PL-112		

Quantity per Equipment	Name of Unit	Army Type Designation	Navy Type Designation	Required Characteristics
2	Battery, Storage (Air Corps 9AC)			14 volts
1	Dynamotor Mounting Bracket			
As Required	Wire			See Figure 5 - 5

4. Description of Major Assemblies:

(a) Transmitter

(1) The transmitter is assembled on a cadmium plated chassis, housed in a case (See figure 1-1) constructed of cold rolled steel, with a black wrinkle finish. Four snapolide fasteners fasten the case to a shock mounting plate located in the fuselage.

(2) Place transmitter with the receptacles to the right and facing the observer the following shall be noted (See figure 1-2). In the top right hand corner is located a momentary push button switch (ST-101) called "Reel in" switch, used to reel in the antenna after tests and before flight. Directly below this switch is located a five pin receptacle (J-101) which supplies operating voltages to the antenna reel motor. Next in line is the antenna receptacle (J-102) and last is the eight pin power input receptacle (J-103), contact numbers one and five of this receptacle connect to the remote operation control. To the left of the "Reel in" switch is located another push button switch called test switch (ST-102) used to operate the equipment for before and after installation tests.

(b) Dynamotor Assembly:

(1) This assembly consists of a modified dynamotor (D-101) with receptacle (J-104) (See figure 5-4).

(2) The dynamotor is to be mounted in the bracket built into the fuselage.

(c) Antenna Equipment:

(1) This equipment consists of a modified reel RT-33-A, mounted on a plate that serves as part of the fuselage, a reel bobbin with 500 feet of wire, a modified fairlead, an antenna connector clamp and an antenna weight.

1. Installation:

a. Unpacking - Remove the equipment from shipping carton and check as follows:

(1) Check the equipment against the list of components.

(2) Remove the top and bottom covers of the transmitter and check for any damage done in shipping.

(3) Check the tubes and crystal holder to see that they are properly seated and that all connections are secure.

(4) Replace transmitter covers.

b. Bench Test:

(1) Coding: Select coding cam to be used and install with stamped letter facing out. Screw the selected cam onto shaft of keyer unit. (This shaft will be found in the keyer hole on one end of transmitter case.) Press microswitch button down to avoid damaging switch. (Refer to figure 2-1)

NOTE

Six coding cams are used for two characters. The transmitted character will be the letter appearing on the side of the cam facing out when installed.

(2) Transmitter:

(a) Connect the batteries, dynamotor and transmitter as per figure 5-3

(b) Connect a 0.5 ampere thermo-ammeter in series with a 120 ohm 100 watt radio frequency type resistor and 330 micromicrofarad variable transmitting type capacitor. (See figure 5-1) Connect the meter to antenna receptacle J-102 and the resistor capacitor to the chassis. This serves as a dummy antenna.

(c) Apply power to the transmitter by holding the "Test Switch" SW-102 in closed position and allow for a "warm up" period.

(d) Turn variable capacitor for dummy antenna until maximum meter

reading is observed (between 1 and 2 [illegible], while on C. W. cycle.) On some units it may be necessary to [illegible] tank condenser (located opposite and [illegible] part) and retune the tank circuit with an insulated screw driver. (see figure 5-2)

CAUTION

> When unlocking and locking tank condenser the transmitter must be turned OFF. Failure to do this will result in a high frequency burn and a severe electric shock, unless an insulated locking wrench is used. Both rotor and stator of tank condenser have B + voltage and radio frequency.

(e) Using a receiver capable of covering the frequency range, tune in the signal and listen for proper coding.

(f) Release tank [illegible] as soon as the check has been made and disconnect dummy antenna.

c. Installing:

1 - Dynamotor Assembly:

(a) Place and secure dynamotor D-101 in bracket with receptacle J-104 facing up.

(b) Insert power cable plug AN3106-22-4S into receptacle J-104 and screw tight.

2 - Transmitter AN/ART-19A

(a) Insert through hole provided in fuselage, keeping receptacle down and to the right. (See figure 5-2)

(b) Raise into position through shock mounting plate and lock into position with the snapslide fasteners.

(c) Attach [illegible] cable, antenna cable and [illegible] power cable. To secure

a permanent connection the coaxial cable should be fastened with clips.

3 - Batteries:

(a) With the label up and terminals facing out, insert one storage battery into the rear of the battery compartment.

(b) Fasten battery into position using battery strap.

(c) Attach battery cables (See figure 5-5)

(d) Insert second storage battery into compartment in the same manner as the first.

(e) Fasten battery into position using battery strap.

(f) Attach battery cables (See figure 5-5)

4 - Antenna:

(a) Insert fairlead through tail of fuselage and secure.

(b) Fasten antenna lead to [illegible] coil close to fairlead.

(c) Allow modified Reel RL-[illegible] to rotate freely. Unreel about 20 feet of antenna wire while feeding wire through fairlead. Install [illegible] to end of antenna after both feet through fairlead. Trim antenna and weight so they will not touch ground or fuselage.

(d) Screw Plug PL-111 into receptacle next to reel motor and tighten.

(e) Place reel motor and mounting plate into the space provided and secure.

NOTE

Do not reel in antenna until operational check has been made.

2. After Installation Check:

(a) Battery check

(1) Turn the transmitter on by holding test switch SW-102 down and allow for a "warm up" period.

(4) Using a D.C. volt meter, measure the voltage of the two [illegible] batteries.

(5) The combined voltage should be [illegible] volts.

NOTE

It would be well to have a suitable receiver at hand for the next operation thus the two can be combined.

(b) Operational Check:

(1) With a receiver covering the frequency used, tune in the signal and check for proper reading.

(2) Turn transmitter off by releasing [illegible] switch.

(3) [illegible] antenna, press reel in switch [illegible]-101 and hold until [illegible].

SECTION III

OPERATION

1. Antenna:

(a) Antenna is automatically extended when transmitter is turned on.

2. Starting Equipment:

(a) Equipment is turned on by a remote switch. This switch is operated by a timing device. The time is set in accordance with length of flight.

SECTION IV

EMERGENCY OPERATION AND REPAIR

1. Emergency Operation and Repair:- After the radio transmitter has been put into use its mode of operation cannot be changed. If the transmitter fails to function properly during a flight no repairs can be made. It must remain inoperative for the remainder of the flight.

SECTION V

SUPPLEMENTARY DATA

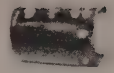
1. Dynamotor Type PE-225 [illegible]

DC Output 375 volts at 150 milliamperes

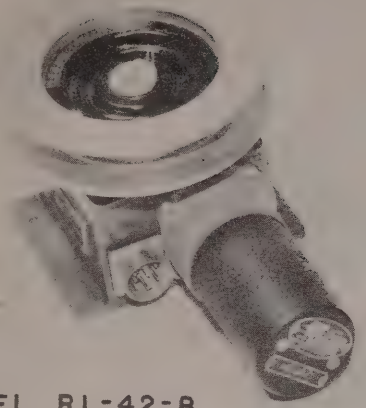
2. Tube Characteristics:

Oscillator and R. F. Amplifier	2516	[illegible]
Filament	25 volts	[illegible]
Current	.3 amperes	[illegible]
DC Plate voltage	200 volts	600 volts
DC Screen voltage	110 volts	300 volts
DC Grid voltage	-8 volts	-200 volts
DC Plate current	50 milliamperes	100 milliamperes
DC Screen current	7 milliamperes	10 milliamperes
Plate dissipation	4.3 watts	30 watts

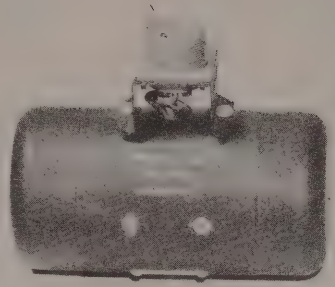
3. Battery - 14 volt aircraft battery



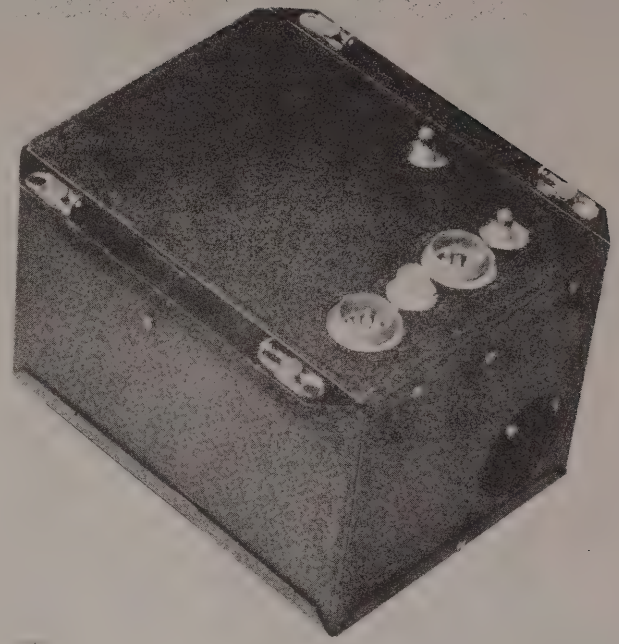
FAIRLEAD ASSEMBLY F-10-A



REEL RL-42-B
(MODIFIED)



DYNAMOTOR
PS-225



WEIGHT WT-7-A

RADIO TRANSMITTER
T-112( )/ART-19

FIGURE 1-1

RADIO SET AN/ART-19A

MAJOR ASSEMBLIES

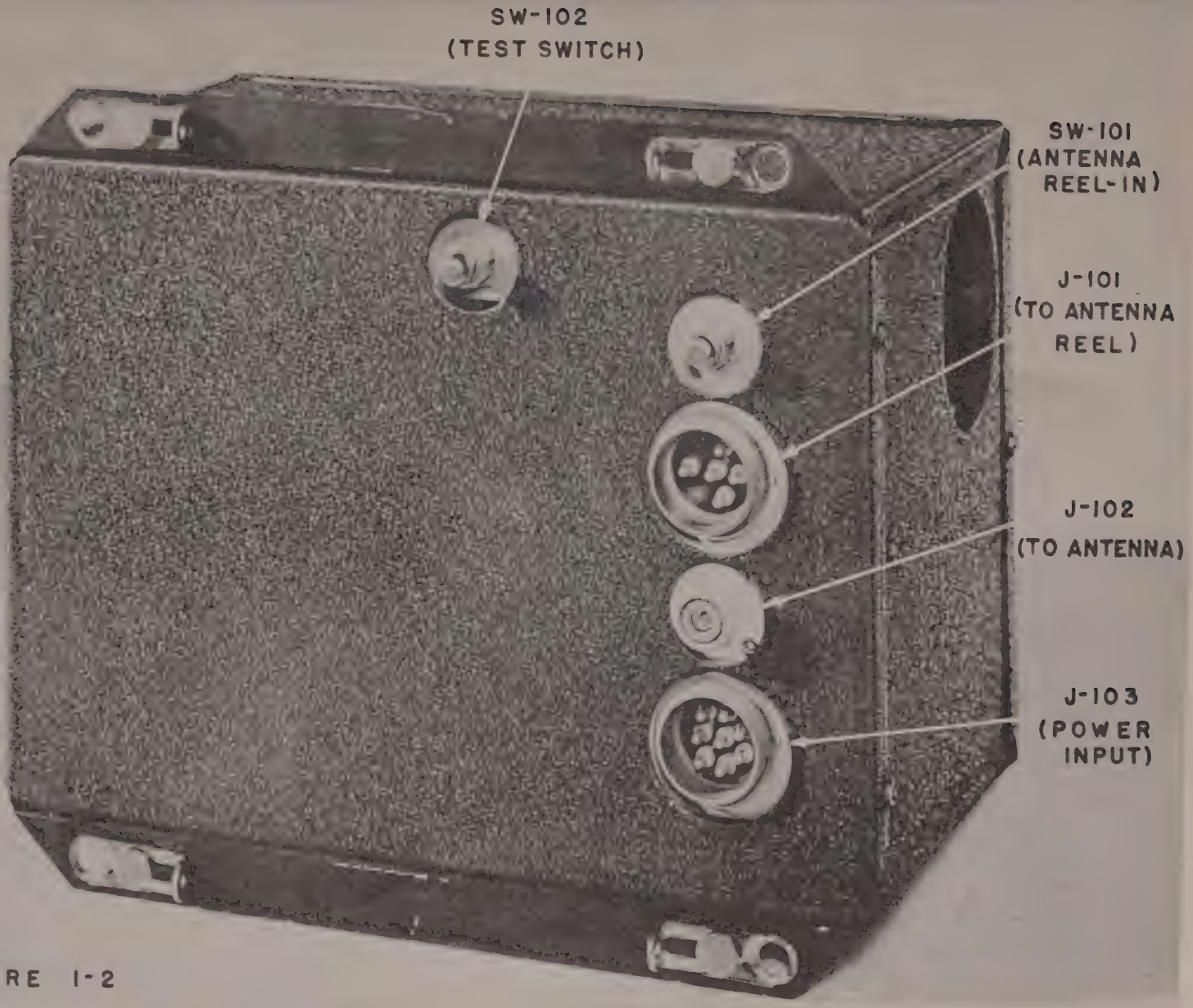


FIGURE 1-2

RADIO TRANSMITTER T-112( )/ART-19 A

SHOWING RECEPTACLES & SWITCHES

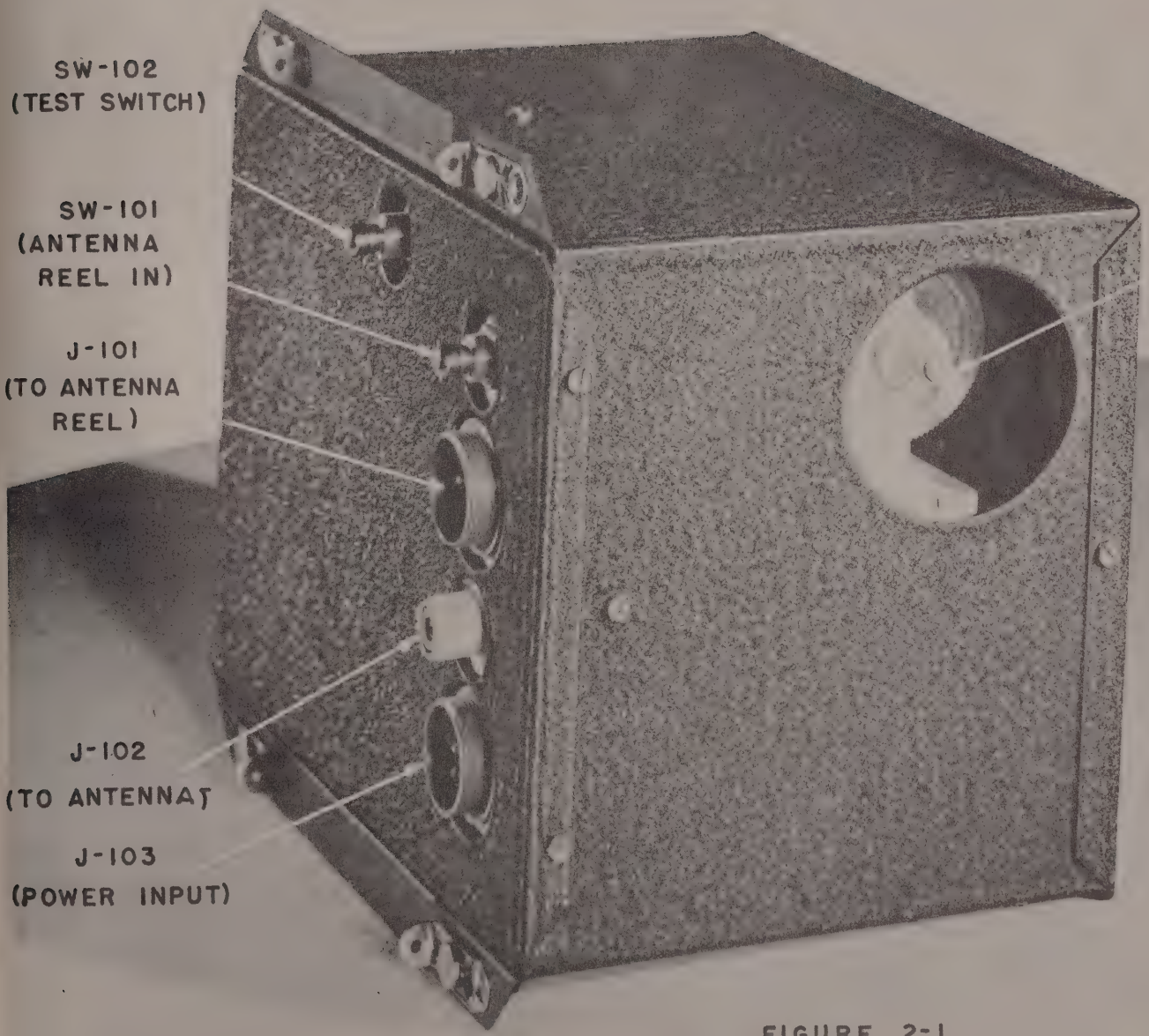


FIGURE 2-1

RADIO TRANSMITTER T-112( )/ART-19A
SHOWING CODING CAM SHAFT,
RECEPTACLES & SWITCHES

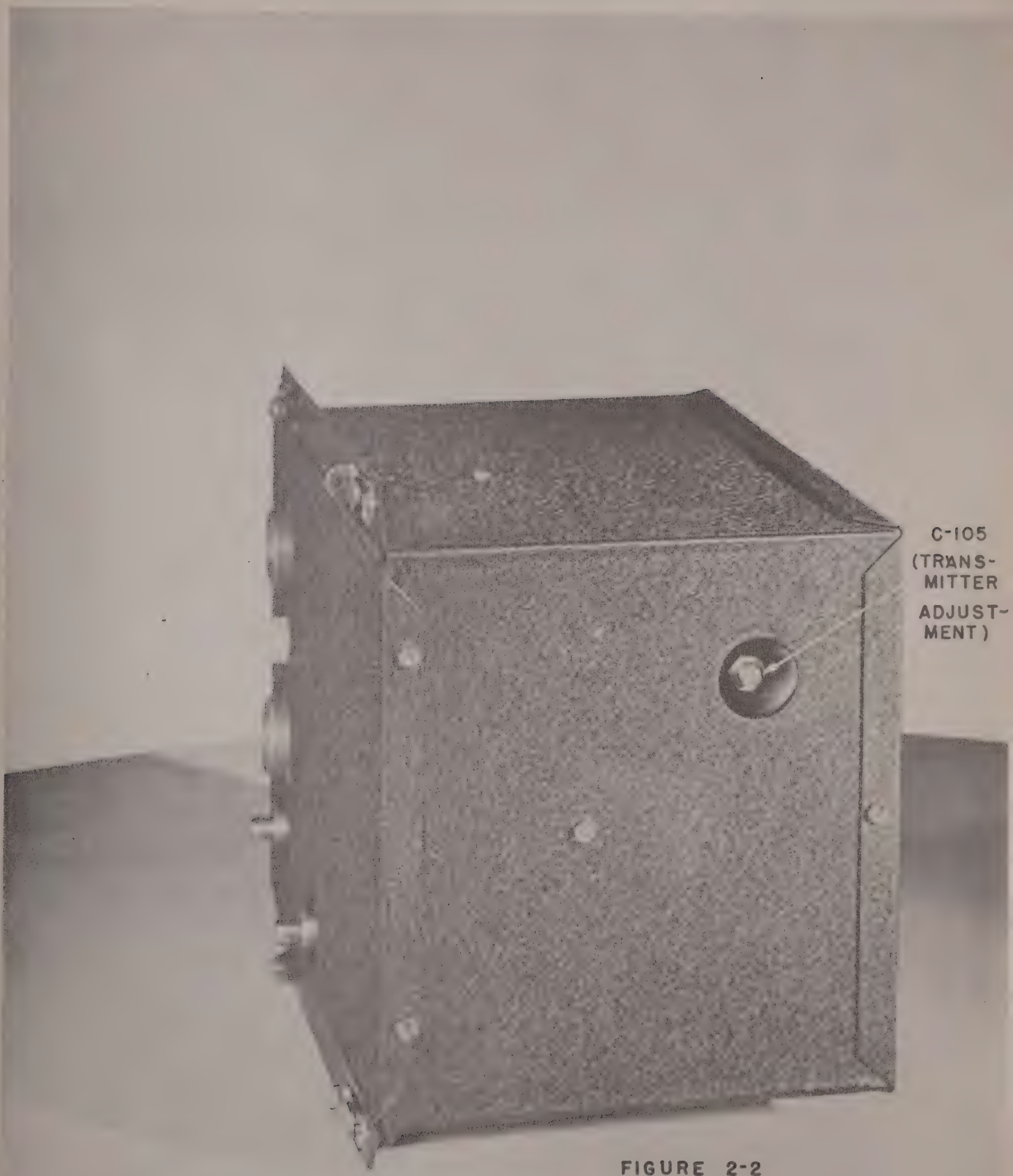


FIGURE 2-2

RADIO TRANSMITTER T-112( )/ART-19A

SHOWING TRANSMITTER ADJUSTMENT

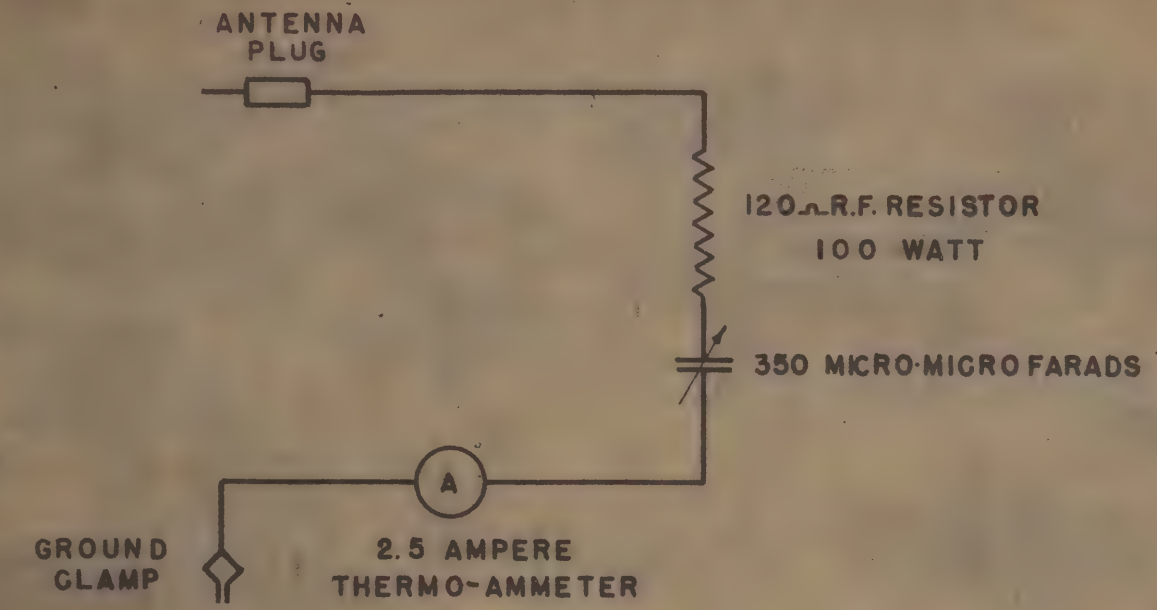


FIGURE 5-1
DUMMY ANTENNA

TOLERANCES
DECIM. DIM. ±
FRACT. DIM. ±
UNLESS OTHERWISE SPECIFIED

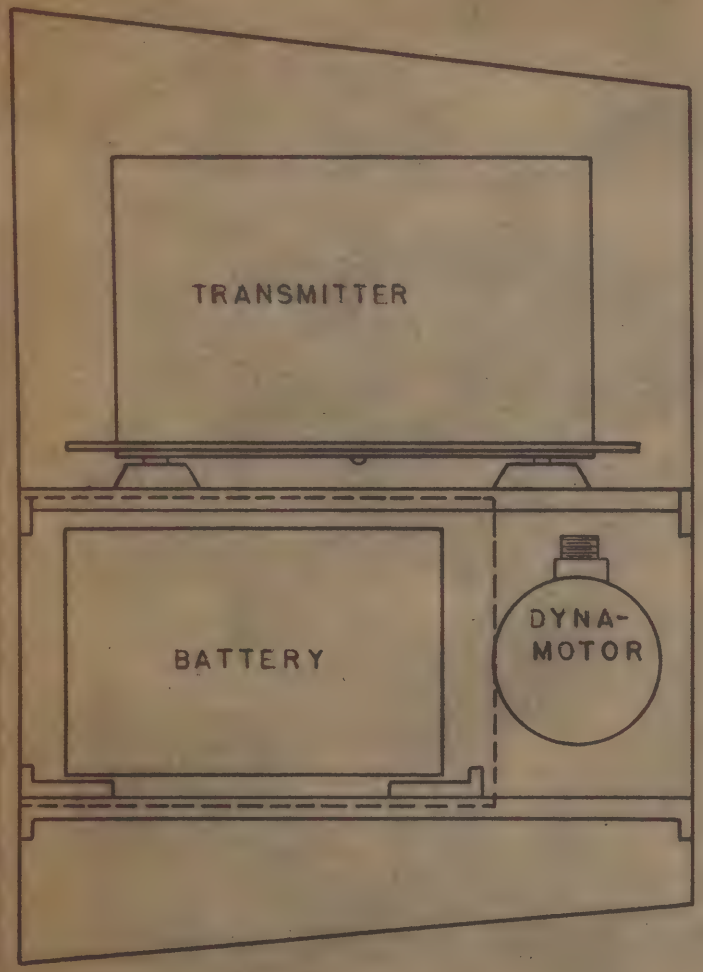
No.	REVISIONS

FIGURE 5-1
AN/ART-19

DR. C.E.S	CH'KD.:	SCALE:
TR. C.E.S	APP'R.:	DATE: 11-24-44

JOHN MECK INDUSTRIES
PLYMOUTH, IND.

DRAWING NO. AN-ART-19-26



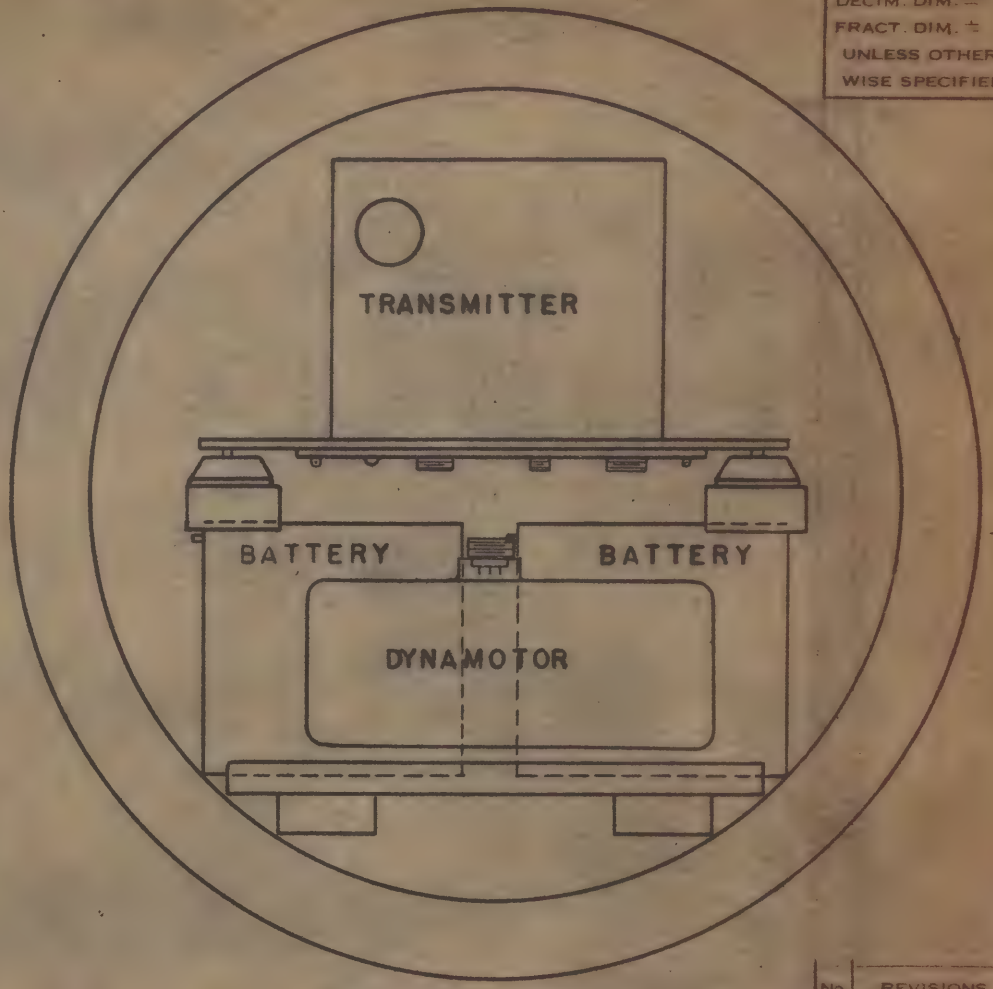


FIGURE 5-2
TYPICAL INSTALLATION

TOLERANCES
DECIM. DIM. ±
FRACT. DIM. ±
UNLESS OTHERWISE SPECIFIED

No.	REVISIONS

FIGURE 5-2
AN/ART-19

DR. C.E.S	CH'KD.:	SCALE;
TR. C.E.S	APP'R.:	DATE: 11-23-44

JOHN MECK INDUSTRIES
PLYMOUTH, IND.

DRAWING NO. AN-ART-19-27

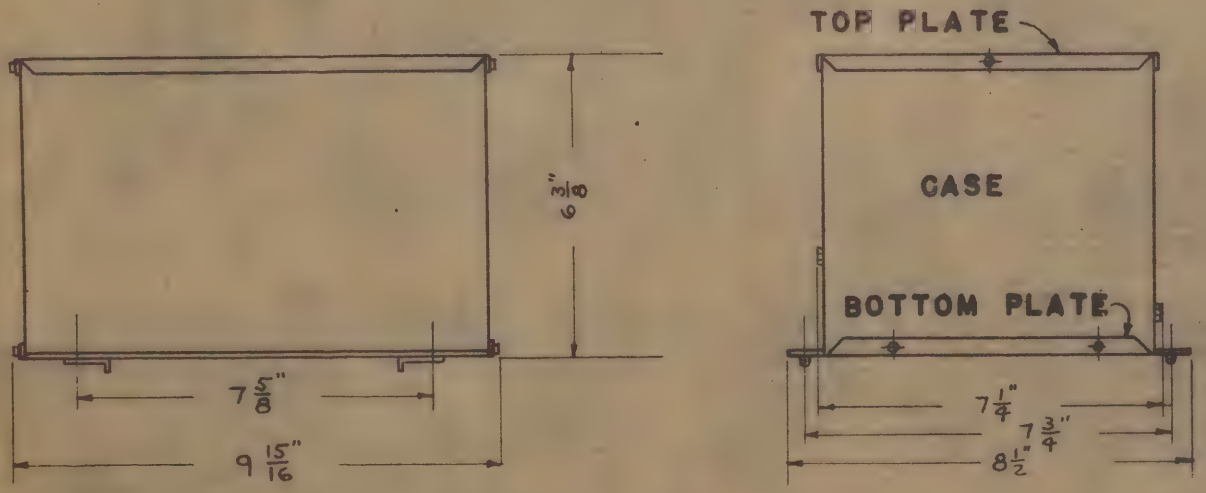


FIGURE 5-3

TRANSMITTER OUTLINE DIMENSIONS

TOLERANCES—
DECIM. DIM. ±
FRACT. DIM. ±
UNLESS OTHERWISE SPECIFIED

No.	REVISIONS

FIGURE 5-3
AN/ART-19

DR. C.E.S.	CH'KD.:	SCALE:
TR. C.E.S.	APP'R.:	DATE: 11-23-44

JOHN MECK INDUSTRIES
PLYMOUTH, IND.

DRAWING NO. AN-ART-19-38

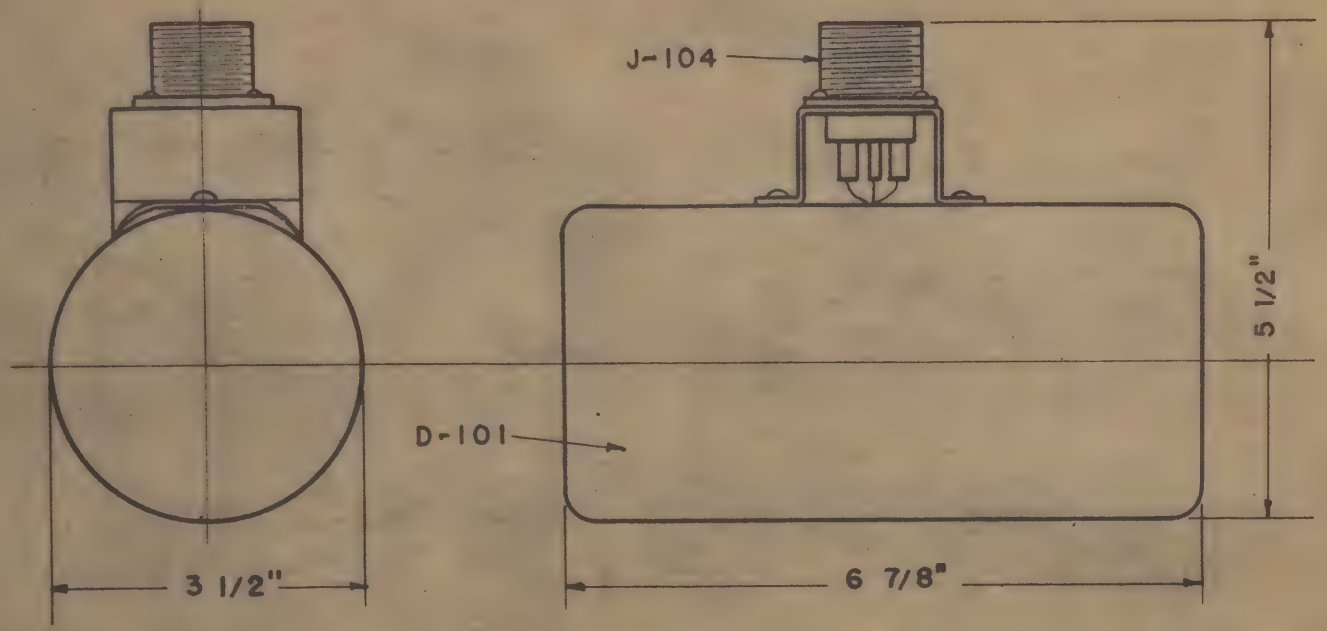


FIGURE 5-4

DYNAMOTOR OUTLINE DIMENSIONS

TOLERANCES --
DECIM. DIM. ±
FRACT. DIM. ±
UNLESS OTHERWISE SPECIFIED

No. REVISIONS

FIGURE 5-4
AN/ART-19

DR. C.E.S.	CH'KD.:	SCALE:
TR. C.E.S.	APP'R.:	DATE: 11-24-44

JOHN MECK INDUSTRIES
PLYMOUTH, IND.

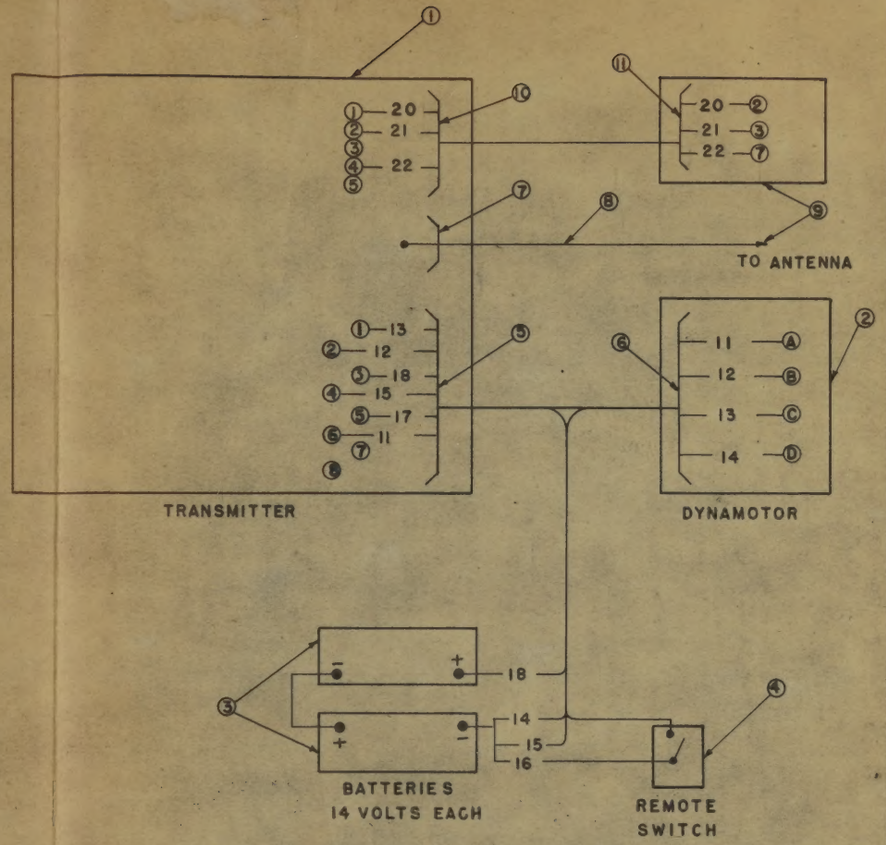
DRAWING NO. AN-ART-19-35

COMPONENT TABLE INDICATES GOVERNMENT FURNISHED EQUIPMENT				
ITEM	QUANTITY REQUIRED	EQUIPMENT NOMENCLATURE		SPECIFICATION or INSTALLATION DRAWING
		DESCRIPTION	TYPE NUMBER	
1	1	RADIO TRANSMITTER	T-112( )/ART-19	
2	1	DYNAMOTOR	PS-225	
3	2	BATTERY	14 VOLT	
4	1	SWITCH		
5	1	PLUG	PL-152-A	
6	1	PLUG	AN-3106-22-4S	AN 9534
7	1	PLUG	PL-259	
8	AS REQUIRED	RADIO FREQUENCY CABLE	RG-8/U	
9	1	REEL	RL-42-B	
10	1	PLUG	PL-156	
11	1	PLUG	PL-112	

CABLE TO BE PER SPECIFICATIONS AN-J-C-48	
CABLE	SIZE
11	AN20
12	AN16
13	AN20
14	AN16
15	AN20
16	AN20
17	AN20
18	AN16
19	AN16
20	AN18
21	AN18
22	AN18

FIGURE 5-5

RADIO SET AN/ART-19A CORDING DIAGRAM



ITEM ① (TRANSMITTER) WT. 11 POUNDS

ITEM ② (DYNAMOTOR) WT. 6.75 POUNDS

POWER REQUIRED 12 AMPERES 28 VOLTS

COMPONENT TABLE

INDICATES GOVERNMENT FURNISHED EQUIPMENT

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1	1	RADIO TRANSMITTER	T-112( )/ART-19	
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4	1	SWITCH		
5	1	PLUG	PL-152-A	
6	1	PLUG	AN-3106-22-4S	AN 9534
7	1	PLUG	PL-259	
8	AS REQUIRED	RADIO FREQUENCY CABLE	RG-8/U	
9	1	REEL	RL-42-B	
10	1	PLUG	PL-156	
11	1	PLUG	PL-112	

CABLE TO BE PER SPECIFICATIONS AN-J-C-48	
CABLE	SIZE
11	AN 20
12	AN 16
13	AN 20
14	AN 16
15	AN 20
16	AN 20
17	AN 20
18	AN 16
19	AN 16
20	AN 18
21	AN 18
22	AN 18

FIGURE 5-5

RADIO SET AN/ART-19A CORDING DIAGRAM